

What is claimed is:

1. A purified polynucleotide encoding a *Vitis vinifera* LOX polypeptide selected from the group consisting of:

a) a polynucleotide comprising the sequence as set forth in SEQ ID NO: 2 or SEQ ID NO: 4,

b) a DNA which hybridizes under moderately stringent conditions to the non-coding strand of the polynucleotide of (a); and

c) a DNA which would hybridize to the non-coding strand of the polynucleotide of (a) but for the redundancy of the genetic code.

2. The polynucleotide of claim 1 which is a DNA molecule.

3. The polynucleotide of claim 2 which is a cDNA molecule.

4. The DNA of claim 3 which is a wholly or partially chemically synthesized DNA molecule.

5. An anti-sense polynucleotide which specifically hybridizes with the polynucleotide of claim 1.

6. The polynucleotide of claim 1 operably linked to a heterologous promoter.

7. A purified and isolated *Vitis vinifera* LOX polypeptide comprising the amino acid sequence as set forth in SEQ ID NO: 1 or SEQ ID NO: 3.

8. An expression construct comprising the polynucleotide of claim 1.

9. A host cell transformed or transfected with the expression construct according to claim 8.

10. A host cell comprising the polynucleotide of claim 6.
11. The host cell of claim 11 which is a *Vitis vinifera* cell.
12. The host cell of claim 11 which is a microorganism selected from the group consisting of yeast and bacteria.
13. A transformed plant comprising the host cell of claim 9.
14. The transformed plant of claim 13 wherein the expression construct comprises a polynucleotide encoding a *Vitis vinifera* LOX polypeptide operably linked to a heterologous promoter.
15. The transformed plant of claim 13 which is *Vitis vinifera*.
16. A method of producing a *Vitis vinifera* LOX polypeptide comprising the step of culturing a host cell transformed with the polynucleotide of claim 1 under conditions selected to express a LOX polypeptide and isolating said LOX polypeptide.
17. A method for modifying the flavor of a comestible comprising contacting said comestible with a quantity of purified and isolated *Vitis vinifera* LOX polypeptide comprising the amino acid sequence as set forth in SEQ ID NO: 1 or SEQ ID NO: 3 under conditions selected to modify the flavor characteristics of the comestible.
18. The method of claim 17 wherein the comestible is a beverage.
19. The method of claim 17 wherein the beverage is a fermentation product.

20. The method of claim 19 wherein the fermentation product is wine.

21. A method for modifying the flavor of a fermented beverage comprising the step of fermenting said beverage in the presence of a microorganism transformed or transfected with an expression construct comprising the polynucleotide of claim 1.

22. The method of claim 21 wherein the beverage is wine.

23. The method of claim 21 wherein the microorganism is selected from the group consisting of yeast and bacteria.

24. A kit for detecting the expression of genes encoding a *Vitis vinifera* LOX polypeptide comprising an oligonucleotide primer capable of hybridizing under stringent conditions to a polynucleotide encoding a *Vitis* vinifera LOX gene selected from the group consisting of:

- a) a polynucleotide comprising the sequence as set forth in SEQ ID NO: 2 or SEQ ID NO: 4,
- b) a DNA which hybridizes under moderately stringent conditions to the non-coding strand of the polynucleotide of (a); and
- c) a DNA which would hybridize to the non-coding strand of the polynucleotide of (a) but for the redundancy of the genetic code.